

WHAT IS CLAIMED IS:

1. A pressure gauge, comprising:
  - a diaphragm having a rigid outer portion and a displaceable inner portion that displaces in response to a pressure difference between first and second sides of the diaphragm;
  - a sensor located proximate to the diaphragm and adapted to sense the displacement of the diaphragm inner portion; and
  - a monitor and control system coupled to the sensor and adapted to determine the pressure difference from the displacement of the diaphragm.
2. The pressure gauge according to claim 1, wherein the diaphragm is sensitive to pressure changes in a range of approximately 0.1 to 0.5 inches of water.
3. The pressure gauge according to claim 1, further comprising an optically reflective coating on a first side of the diaphragm inner portion, wherein the sensor includes an optical transmitter and receiver optically aligned with the optically reflective coating.
4. The pressure gauge according to claim 3, wherein the sensor comprises an interferometer.
5. The pressure gauge according to claim 3, wherein the sensor comprises a white light interferometer.
6. The pressure gauge according to claim 3, wherein the sensor comprises:
  - a light transmitting module; and
  - a light sensing module adapted to directly receive a first light beam transmitted from the light transmitting module, and to receive a second light beam transmitted from the light transmitting module and reflected from the diaphragm;wherein the monitor and control system calculates the displacement of the diaphragm from an interference pattern generated from the first and second lights.

7. The pressure gauge according to claim 6, wherein the light transmitting module comprises a transmitting fiber having an output coupled to a diffraction device that separates a source light into the first and second lights, wherein changes in the diaphragm displacement cause the interference pattern to include intensity modulated light, wherein the monitor and control system calculates the diaphragm displacement from the intensity modulated light.
8. The pressure gauge according to claim 6, wherein the light transmitting module comprises first and second transmitting fibers, the first transmitting fiber outputting the first light at a first wavelength, the second transmitting fiber outputting the second light at a second wavelength, wherein the second wavelength is phase shifted relative to the first wavelength, wherein changes in the diaphragm displacement cause the interference pattern to change with a substantially constant speed, wherein the monitor and control system comprises a counter that decodes the diaphragm displacement from the substantially constant speed.
9. The pressure gauge according to claim 1, wherein the inner portion of the diaphragm includes a grounded metallic surface, wherein the sensor includes a capacitive sensing device positioned adjacent to the grounded metallic surface, and wherein the monitor and control system determines the displacement based on capacitive changes in the capacitive sensing device.
10. A proximity sensor for lithography, comprising:
  - a measurement leg having a measurement probe coupled thereto;
  - a reference leg having a reference probe coupled thereto;
  - a bridge portion coupled between the measurement leg and the reference leg; and
  - a pressure sensor disposed within the bridge portion.

11. The proximity sensor according to claim 10, wherein the pressure sensor comprises:

a diaphragm having a rigid outer portion and a displaceable inner portion that displaces in response to a pressure difference between the measurement leg and the reference leg;

a sensor located proximate to the diaphragm and adapted to sense the displacement of the diaphragm inner portion; and

a monitor and control system coupled to the sensor and adapted to determine the displacement of the diaphragm and adapted to determine the pressure difference from the displacement.

12. A proximity sensor for lithography, comprising:

a measurement leg having a measurement probe coupled thereto;

a reference pressure;

a bridge portion coupled between the measurement leg and the reference pressure;

a diaphragm disposed within the bridge portion, the diaphragm including a rigid outer portion and a displaceable inner portion that displaces in response to a pressure difference between the measurement leg and the reference pressure;

a sensor located proximate to the diaphragm and adapted to sense the displacement of the diaphragm inner portion; and

a monitor and control system coupled to the sensor and adapted to determine the displacement of the diaphragm and to determine the pressure difference from the displacement.

13. A lithography topography mapping device, comprising:

a measurement leg having a measurement probe coupled thereto;

a reference pressure;

a bridge portion coupled between the measurement leg and the reference pressure;

a diaphragm disposed within the bridge portion, the diaphragm including a rigid outer portion and a displacable inner portion that displaces in response to a pressure difference between the measurement leg and the reference pressure;

a sensor located proximate to the diaphragm and adapted to sense the displacement of the diaphragm inner portion; and

a monitor and control system coupled to the sensor and adapted to determine the displacement of the diaphragm and to determine the pressure difference from the displacement.